BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#15

In re Application of Dominguez de Walter et al.	
U. S. Serial No. 08/520,662	Group Art Unit: 1207
Filed: August 28, 1995	Examiner: S. Acquah
Attorney Docket No.: HOE-94/F-249	
Title: PROCESS FOR THE PREPARATION OF HEAT-STABLE, ANTIMONY-FREE POLYESTERS OF NEUTRAL COLOR AND THE PRODUCTS WHICH CAN BE PREPARED BY THIS PROCESS	APR 29 1997

Assistant Commissioner for Patents
Washington, D.C. 20231

APPELLANT'S BRIEF (37 C. F. R. §1.192)

Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on January 31, 1997.

The fees required under §1.17(f), and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate (37 C.F.R. §1.192(a)).

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. §1.192(c)):

CERTIFICATE OF MAILING (37 CFR 1.8(a))

I hereby certify that this paper (along with any paper r ferred to as b ing attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Date: April 09, 1997

Doris A. Burrell

Doris A. Burrell
(Person Mailing Paper)

The final page of this brief bears the attorney's signature.

I. REAL PARTY IN INTEREST (37 C.F.R. §1.192(c)(1))

The real party in interest in this appeal is the assignee, Hoechst Aktiengesellschaft.

II. RELATED APPEALS AND INTERFERENCES (34 C.F.R. §1.192(c)(2))

There are no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS (37 C.F.R. §1.192(c)(3))

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims 1-29 are pending in this application.

B. STATUS OF ALL THE CLAIMS

1. Claims 8, 9, 16-18, 27 and 28 have been withdrawn from consideration but not canceled.
2. Claims 1-7, 10-15, 19-26 and 29 have been examined.
3. Claims allowed: NONE
4. Claims 1-7, 10-15, 19-26 and 29 are rejected.

C. CLAIMS ON APPEAL

Claims 1-7, 10-15, 19-26 and 29 are on appeal.

IV. STATUS OF AMENDMENTS (37 C.F.R. §1.192(c)(4))

A final rejection was mailed on July 31, 1996 (Paper No. 8). Appellants' response to the final rejection, filed November 4, 1996, was considered but was deemed not to place the application in condition for allowance. As set forth in the Advisory Action, mailed December 3, 1996, the amendment in response to the final rejection was entered upon the filing of an appeal and the response overcame the §112 rejection of claims 1 and 8. Claims 1-7, 10-15, 19-26 and 29 remain rejected under 35 U.S.C. 102(b).

A Notice of Appeal was filed on January 31, 1997.

V. SUMMARY OF THE INVENTION

The present invention is directed to a two stage process for the preparation of heat-stable, antimony-free polyesters of neutral color in a manner that is easily reproducible. Also claimed are the polyester products prepared by the claimed process. The invention is distinguished by a specific combination of catalysts for each of the esterification (or transesterification) and

polycondensation stages. Advantageously, the claimed process is characterized by a high rate of polycondensation and there is a significant reduction in thermal degradation and uncontrolled crosslinking of the polyester products.

VI. ISSUE

Are claims 1-7, 10-15, 19-26 and 29 anticipated by U.S. Patent No. 4,208,527 to Horlbeck et al. and U.S. Patent No. 4,131,601 to Hashimoto et al?

VII. GROUPING OF CLAIMS

Claims 1-7, 10-15, 19-26 and 29 stand or fall together.

VIII. ARGUMENT: REJECTION UNDER 35 U.S.C. §102(b)

Claims 1-7, 10-15, 19-26 and 29 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Horlbeck et al. and Hashimoto et al.

The claimed invention is directed to a two stage reaction for the preparation of heat-stable, antimony-free polyesters of neutral color (process claims 1-9, 21-24, 27 and 29). Also claimed are the polyester products prepared by the claimed process (product claims 10-20, 25, 26 and 28). The two-step process comprises (1) an esterification of an aromatic dicarboxylic acid or transesterification of a lower aliphatic ester of an aromatic dicarboxylic acid with an aliphatic diol and (2) polycondensation.

The claimed invention is distinguished by the kinds of catalysts that are used and those that are not used. For example, there is an express absence of antimony compounds. Moreover, a specific combination of catalysts are employed for each of the two stages of the reaction:

STAGE	CATALYST
I. ESTERIFICATION OR TRANSESTERIFICATION	• transesterification metal catalyst, preferably Mn
II. POLYCONDENSATION	• complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and their acid esters • Co compound • Ti compound, preferably potassium titanyloxide

The cited prior art is similarly directed to processes for the manufacture of high molecular weight PET in two stages, i.e., esterification or transesterification and polycondensation. **However, the cited art is notable for its teaching that the kinds of catalysts that are used influence the reaction and determine the characteristics of the polyester product:**

> ...the commonly used catalysts promote not only the reaction by which the polyester is built up but also degradation reactions during transesterification and polycondensation. As a result, they effectively determine essential characteristics of the polyester, such as color, melting point and stability to heat (Horlbeck et al., col. 1, lines 40-46).
>
> and
>
> The rate of polycondensation and the qualities of the resulting polyester are greatly influenced by the kind(s) of catalyst(s) used. (Hashimoto et al., col. 1, lines 31-33).

Thus, relying upon the express teachings of the cited art, Appellants argue that the kinds of catalysts employed in the present invention distinguish the claimed process and polyesters from the prior art. Specifically, as demonstrated by the following Table, the claim d process and polyester product are diff r nt from

the prior art because the combination of catalysts which defin s App llants' invention is different from the catalysts used by the prior art:

STAGE	CLAIMED INVENTION	HORLBECK	HASHIMOTO
I. ESTERIFICATION OR TRANSESTERIFICATION	catalyst = Mn	catalyst = Mn/Co (col. 3, line 3-10)	catalyst = Mn/Co (col. 3, lines 19-34)
II. POLYCONDENSATION	complexing agent = P color agent = Co catalyst = Ti	inhibitor = P catalyst = Ge/Ti (col. 3, lines 10-31)	catalyst = a preformed Ti compound (col. 2, lines 20-27) stabilizer = P (Examples)

With specific regard to Horlbeck et al., Co is added as a catalyst, together with Mn, during the esterification or transesterification stage. In accordance with the claimed invention, Co is optionally added during the subsequent polycondensation stage to improve the color shade of the polyester product (See, specification at page 5, lines 16-19). As such, Co does not contribute to the inventive reaction. The polycondensation catalyst of Horlbeck et al. is a Ge/Ti co-catalyst. In contrast, the only polycondensation catalyst of the claimed invention is a Ti compound, e.g., potassium titanyloxide (See, claim 29).

Thus, each and every element of the claimed invention is not found within the four corners of the reference to Horlbeck et al. The combination of catalysts are unique for the esterification/transesterification and polycondensation stages of the present invention relative to Horlbeck et al.

Therefore, as taught by the cited art, the claimed process and polyester products must be different from Horlbeck et al.. Accordingly, the rejection of claims 1-7, 10-15, 19-26 and 29 under 35 U.S.C. §102(b) as being anticipated by Horlbeck et al. is reversible error.

With regard to Hashimoto et al., Co is added as a catalyst during esterification or transesterification, whereas in the claimed invention, Co is optionally added to improve the color shade of the polyester product when esterification or transesterification has ended (See, specification at page 5, lines 16-19). As such, Co does not contribute to the reaction. The polycondensation catalyst of Hashimoto et al. is a preformed titanate compound obtained by reacting a titanic acid ester of the formula $Ti(OR)_4$ with an aromatic acid to form an anhydride (col. 36-41). In contrast, the polycondensation catalyst of the claimed invention is a Ti-compound, e.g., potassium titanyloxylate, that is not pre-reacted with any of the reactants (See, claim 29). **Moreover, Hashimoto et al. teach that half or a lesser amount of the preformed titanate catalyst may be replaced by an antimony compound (col. 4, lines 54-62)**. This teaching is in direct contrast to the claimed invention which is directed to a process for the preparation of antimony-free polyesters. Therefore, the Examiner errs when he states on page 5 of the final Office Action that the prior art does not "disclose the use of antimony".

Thus, each and every element of the claimed invention is not found within the four corners of the reference to Hashimoto et al. The combination of catalysts are unique for the esterification/transesterification and polycondensation stages

of the present invention relative to Hashimoto et al. Therefore, as taught by the cited art, the claimed process and polyester product are different from Hashimoto et all. Accordingly, the rejection of claims 1-7, 10-15, 19-26 and 29 under 35 U.S.C. §102(b) as being anticipated by Hashimoto et al. is improper.

IX. APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

1. A process for the preparation of a heat-stable antimony-free polyester of neutral color comprising the esterification of an aromatic dicarboxylic acid or transesterification of a lower aliphatic ester of an aromatic dicarboxylic acid with an aliphatic diol in the presence of 20 to 120 ppm of a transesterification metal catalyst, which is added in the form of a metal compound, and subsequent polycondensation, wherein after the esterification or transesterification has ended, a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and the esters of such acids is added to the esterification or transesterification batch in an amount which is 100% of the amount equivalent to the transesterification catalyst employed and up to 99% of the amount equivalent to cobalt to be employed, and wherein up to 80 ppm of cobalt in the form of a cobalt compound is added to the batch, and the polycondensation is carried out without the addition of antimony, in the presence of 1 to 10 ppm of titanium, which is added in the form of a titanium compound.

2. The process as claimed in claim 1, wherein, the complexing agent is added to the esterification or transesterification batch in an amount of 100% of the amount equivalent to the transesterification catalyst employed and 90 to 99% of the amount equivalent to the cobalt to be employed.

3. The process as claimed in claim 1, wherein a melt is formed during the polycondensation which is carried out in the presence of 1 to 10 ppm of titanium up to an intrinsic viscosity [IV], measured in dichloroacetic acid at 25°C, of 0.4 to 0.9 dl/g and up to a carboxly group concentration of 10 to 50 mmol/kg in the melt, and then wherein the polycondensation is continued up to the desired end viscosity in the solid phase.

4. The process as claimed in claim 1, wherein 20 to 40 ppm of cobalt in the form of a cobalt compound are added to the batch.

5. The process as claimed in claim 1, wherein the polycondensation is carried out in the presence of 2-8 ppm of titanium.

6. The process claimed in claim 1, wherein the polycondensation is carried out in the presence of 100 to 500 ppm of crosslinking agents.

7. The process as claimed in claim 1, wherein the polycondensation is carried out in the presence of up to 25 ppm of an optical brightener.

10. A heat-stable, antimony-free polyester of neutral color based on an aromatic dicarboxylic acid and an aliphatic diol, prepared by the process as claimed in claim 1, in which, in the non-matted state, its color number components are

a* in the range from -3 to +3,

b* in the range from -6 to +6 and

L* in the range from 55 to 75.

11. A heat-stable, antimony-free polyester of neutral color based on an aromatic dicarboxylic acid and an aliphatic diol as claimed in claim 10, which comprises 1 to 10 ppm of titanium, 20 to 120 ppm of a transesterification catalyst metal in the form of catalytically inactive complexes with a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and the esters of such acids, and 0 to 80 ppm of cobalt, which is partly present in the form of catalytically inactive complexes with a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and derivatives thereof.

12. (Amended) A heat-stable, antimony-free polyester of neutral color as claimed in claim 10, which comprises 2 to 8 ppm of titanium, 50 to 90 ppm of maganese in the form of catalytically inactive complexes with a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and the esters of such acids, and 20 to 40 ppm of cobalt, which is partly present in the form of catalytically inactive complexes with a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and derivatives thereof.

13. A heat-stabled, antimony-free polyester of neutral color as claimed in claim 10, in which, in the non-matted state, its color number components are
a* in the range from -2 to + 2,
b* in the range form -3.5 to +3.5 and
L* in the range from 60 to 70.

14. A heat-stable, antimony-free polyester of neutral color as claimed in claim 10, in which 90 to 99% of the cobalt is in the form of one or more catalytically inactive complexes with a complexing agent selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and the esters of such acids.

15. A heat-stable, antimony-free polyester of neutral color as claimed in claim 10, which compromises 5 to 25 ppm of an optical brightener.

19. A heat-stable, antimony-free polyester of neutral color as claimed in claim 10, in which the catalytically inactive complexes of manganese and of cobalt are complexes with phosphorous acid or an ester thereof.

20. A heat-stable, antimony-free polyester of neutral color as claimed in claim 10, which further comprises up to 1000 ppm of crosslinking structural groups.

21. The process as claimed in claim 1, wherein the transesterification catalyst is manganese in the form of a manganese compound.

22. The process as claimed in claim 1, wherein the polycondensation is carried out in the presence of up to 1000 pmm of crosslinking agents.

23. The process as claimed in claim 1, wherein the polycondensation is carried out in the presence of up to 50 ppm of an optical brightener.

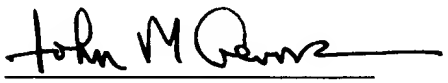
24. The process as claimed in claim 3, wherein the end viscosity of the heat-stable antimony-free polyester is 0.7 to 2.0 dl/g, measured in dichloroacetic acid at 25°C.

25. A heat-stable, antimony-free polyester of neutral color as claimed in claim 11, which further comprises up to 50 ppm of an optical brightener.

26. A heat-stable, antimony-free polyester of neutral color as claimed in claim 12, which further comprises up to 25 ppm of an optical brightener.

29. The process as claimed in claim 1, wherein the titanium compound is potassium titanyloxalate.

Respectfully submitted,



John M. Genova, Esq.
Attorney for Applicants
Registration No. 32,224

HOECHST CELANESE CORPORATION
86 Morris Avenue
Summit, New Jersey 07901
(908) 522-7531